

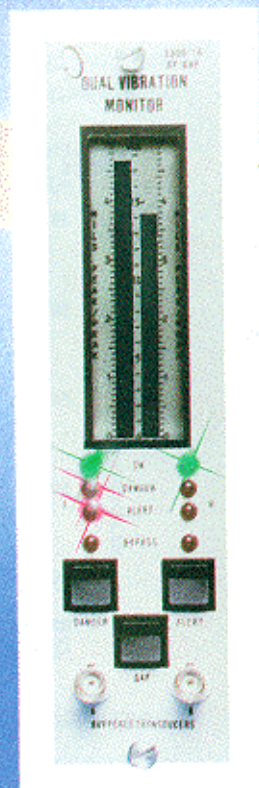


Managing machinery in t

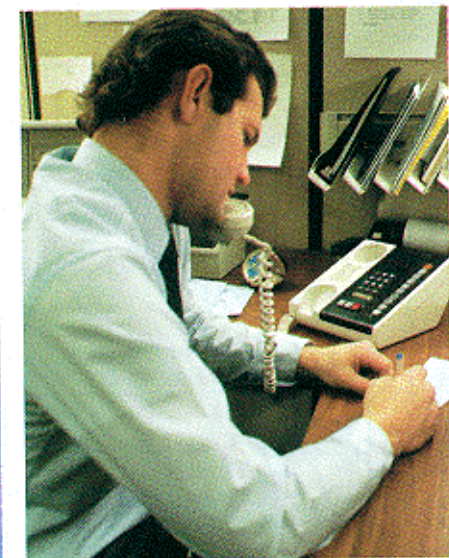


Control Room Operator

Machine in Alarm!



DDM2/TDM2
System



Engineer reviews Engineer Assist report. Instructions are sent to the operator.

Engineer's Report
Actionable Information



Detail
Printed

Management
Informed

he 90's...a paradigm shift



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The increasingly competitive global marketplace poses new challenges to managing all aspects of plant operation. One of the most significant changes is an industry-wide trend to reduce costs by downsizing the number of plant personnel at each plant. Today, plants are often working with staffing levels that are 20-50% lower than they were during the 80's.



**Management Report
Actionable Information**

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report

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In addition, there is a push to extend machine operating time between major outages and overhauls. Today, in order to maintain a safe and reliable facility with fewer employees, each person's productivity must be increased and new machinery management techniques implemented.

Permanently-installed vibration monitoring systems help detect early warning signs on your critical rotating machinery to avoid catastrophic failures. Data from these systems can be acquired and stored manually or on dedicated diagnostic systems. During the 80's, plant managers relied upon rotating machinery specialists to review and interpret this information to determine the mechanical integrity of machinery. This was a time-consuming task which could only be performed on a periodic basis. Today, as a result of downsizing, machinery specialists may not be available to perform these tasks or are occupied with other duties. To ensure the continued safe and reliable operation of rotating machinery, new technology must be used to fill the gap.

Bently Nevada has developed an expert system, Engineer Assist™, which can help solve these problems. The major value of an expert system is to automate the process of reviewing a large and complex database to convert critical data into actionable information.

Actionable information

Actionable information is complete, concise information which can be used to make immediate decisions. Actionable information results from continuous online audits of machinery and helps answer key questions, such as: How long can I run this machine? Can I adjust the process to extend the operation and avoid a shutdown? Actionable information identifies a machine problem, its source and makes recommendations for corrective action. Actionable information is provided in Engineer Assist's engineering and management reports, which are automatically compiled each time a machine audit is performed. Management can then make effective decisions and an action plan can be implemented.

Engineer Assist's actionable information can help you decide the following:



Should I plan an overhaul at the next scheduled outage?



What maintenance should be performed?



Which parts may need replacement?

Continuous online machinery audits also help you decide whether to continue operation of your machinery and extend the time period for planned outages.

Benefits of training

Engineer Assist also benefits your training program. Its reports contain complete explanations of the data used and how it was evaluated to diagnose a specific malfunction. Exposure to this methodology will help teach your employees how to properly isolate and verify machinery malfunctions. Engineer Assist is the end result of over forty years of rotating machinery knowledge acquired by Bently Nevada engineers and researchers. This product has over 1000 man-years of rotating machinery knowledge embedded in its actionable information process.

Chemical plant case history

A major chemical company recently installed our Engineer Assist Online System, which automatically performs machine train audits when a vibration alarm occurs. The plant's compressor train provides feedstock to several other chemical plants. A forced outage of this machine train would cost \$26 million dollars per day in total lost production. The compressor train went into alarm during the early morning hours, shortly after Engineer Assist had been installed. Engineer Assist immediately responded to this event and performed an audit of the machine train. When engineering personnel arrived at the plant the next morning, all of the engineering reports from Engineer Assist were available for their review.

Engineer Assist reported an instability malfunction on one of the compressors. Plant engineering personnel took immediate corrective action. The compressor train was operated at a lower speed and flow rate, which reduced vibration levels and permitted continued operation. The machinery manufacturer was contacted regarding the instability problem and began designing a new aerodynamic seal which will prevent a reoccurrence of the instability. The new seal will be installed during an upcoming planned outage.

Conclusion

Actionable information, obtained through Engineer Assist, enabled management to make an informed decision to continue operating their machine train at a reduced capacity. This decision was based on the plant's ability to carefully monitor any further degradation and to use Engineer Assist to provide continuous updates on any changes in machine condition.

Machinery management in the 90's can benefit from a paradigm shift to expert system technology. Using this technology can maximize the efficiency of plant personnel, increasing their productivity.

For more information on our Engineer Assist Software, contact your nearest Bently Nevada sales representative. ■